



VFA.facility integrates both deferred maintenance and capital renewal projection findings into comprehensive facility funding analyses. Various strategies can be comparatively analyzed including various funding levels, various distributions of funding and testing of assumption parameters. Using this tool, optimal facility investment strategies can be identified.

Three investment scenarios for the Kentucky State University-Frankfort are included at the end of this section. These models are based on long range planning discussions and illustrate compelling plant needs. These models do not include debt service as a renewal investment. The assessment treats the original capital expenditure as a renewal investment. Adding the debt service counts the single investment twice.

The model integrates the current condition information and the annual renewal projections to analyze various funding schemes. Building replacement cost is annually adjusted by the inflation rate identified, in this case 4.7%. If the institution anticipates plant growth, this rate is reflected in both the replacement cost and the overall FCI, assuming that growth is via new construction with $FCI = 0$. Anticipated new requirements are estimated, as the further deterioration of current requirements not corrected, at the backlog deterioration rate identified as 2%, and the results of the renewal forecast. The inflation and backlog deterioration rate are based on VFA experience, client data or published inflation rates in national publications such as the Cost Construction News. With these factors, various funding schemes can be analyzed and the effect on the building condition estimated. All figures are adjusted for inflation over the duration of the analysis; the discount rate used for net present value calculations is the inflation rate as well. Other discount rates can be used, to reflect the opportunity cost associated with a facility investment. The investment should be assumed to include major repair costs (other than those for custodial or routine maintenance needs) and any capital projects that substantially affect the condition of the plant, such as building or partial building renovations.

The graphs and tables that follow identify funding strategies and show the associated effects on condition, in terms of the FCI (see Assessment Methodology section for a discussion and definition of FCI). The Comparison of Options presents key results such as applied funding and FCI and backlog at end of funding period for the three scenarios. For the graphical presentation, bars indicate annual dollars invested, as indicated on the left axis, and the lines indicate the effect of this funding on the FCI, as indicated on the right axis. The spreadsheets have been projected over 20 years for clarity; further extensions of the model are possible. The following scenarios are presented for the Kentucky State University-Frankfort:

0.5% of CRV - explores the effects of investing 1/2% of current replacement value (CRV). The present condition is considered poor according to industry standards, with an overall FCI of **0.25**. Over 20 years the condition steadily deteriorates with the FCI increasing to **1.02**. Total aggregated net present plant value after funding is \$-912,122 down from the initial \$31,543,824. Total aggregated net present value of 20 years worth of deferred maintenance, at this funding level, has resulted in a backlog of work estimated at \$42,932,003 a significant increase from the current backlog of \$10,476,057.

Option Two explores the effects of investing 1/2% of current replacement value (CRV). The present condition is considered poor according to industry standards, with an overall FCI of **.25**. Over 20 years the condition steadily remains with the FCI of **0.25**. Total aggregated net present value of 20 years worth of deferred maintenance, at this level of funding, has resulted in a backlog that remains at \$10,476,057, given the assumed zero plant growth. The total aggregated net present value of a 20-year asset investment is \$31,481,860.

Option Three explores the effects of setting funding levels to maintain the overall FCI to **0.05**, which is considered good by industry standards. In this scenario, the building improvements are distributed over a multi-year period increasing the FCI to an efficient 0.05 in 10 years, and maintained at this level thereafter. This scenario implies continued use of the facilities during renewal improvements. Total aggregated net present value of 20 years building investment is \$37,434,888. Total aggregated net present value of 20 years worth of preventive maintenance has resulted in a backlog of work estimated at \$2,100,994. At the end of the 20-year period, this backlog can be envisioned as a balloon payment of \$2,100,994 coming due to fix the requirements. Combining \$2,100,994 and the \$37,434,888 invested over 20 years yields roughly an aggregate investment of **\$39,535,882** into the facilities to maintain the facilities in good condition.

These options reflect only three of the many possible scenarios. Additional scenarios can easily be run on the data.